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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/643,975	08/20/2003	Hiroyuki Minemura	1021.43050X00	4972

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EXAMINER
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DANIELSEN, NATHAN ANDREW

ART UNIT	PAPER NUMBER
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2627

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/21/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<b>Office Action Summary</b>	Application No. 10/643,975	Applicant(s) MINEMURA, HIROYUKI	
	Examiner Nathan Danielsen	Art Unit 2627	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 15 December 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-6 is/are allowed.
- 6) ☒ Claim(s) 7-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 December 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

Art Unit: 2627

### DETAILED ACTION

1. Claims 1-10 are pending.

#### *Specification*

2. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: "the leftmost M1 coefficient and the rightmost M2 coefficient in a coefficient array are all zero while integer values M1 and M2 satisfy a relationship of ' $M1 \geq 0$ ,  $M2 \geq 0$ ,  $M1 + M2 \geq 1$ ,  $M1 + M2 < N$ '".

#### *Claim Objections*

3. Claim 1 is objected to because "leftmost M1 coefficient" and "rightmost M2 coefficient" should be "leftmost M1 coefficients" and "rightmost M2 coefficients", respectively. Additionally, it is requested that this particular paragraph of the claim be amended such that upon reading it, one may readily ascertain that M1 and M2 represent a count of "0" coefficients, not the values of the coefficients. Appropriate correction is required.

#### *Claim Rejections - 35 USC § 112*

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:  
  
The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
5. Claims 7-10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 7 recites the limitation "said drive" in the preamble. There is insufficient antecedent basis for this limitation in the claim.

Claim 9 is rejected as being indefinite because: the limitation "the result" lacks antecedent basis in the claims, it is unclear if the claimed "result" is an output of the

Art Unit: 2627

compensation calculation unit or the waveform equalizer, and, if the result is an output of the compensation calculation unit, it is unclear how a signal/value can be subtracted from the circuitry/software comprising the waveform equalizer. Claims 8 and 10 are rejected as being dependent on an indefinite claim.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hayami et al (US Patent 6,683,922; hereinafter Hayami), in view of Miyashita et al (US Patent Application Publication 2002/0067677; hereinafter Miyashita).

Regarding claim 7, Hayami discloses an information reproducing drive for outputting a binary value obtained from a reproduced signal with use of a PRML method, said drive comprising:

- a PR target output unit for outputting a PR class target value corresponding to an N-bit bit array (figures 4 and 6);
- a decode unit including a pattern compensation table for storing a compensation value corresponding to each M-bit ( $M > N$ ) bit array (figures 4 and 6); and
- a branch metric calculation unit for calculating a branch metric value for each bit array by employing a target value obtained by adding up a PR target value output from said PR target value output unit and a compensation value stored in said pattern compensation table with respect to an output from said waveform equalizer (figures 4, 6, and 7).

However, Hayami fails to explicitly disclose where the information reproducing drive further comprises a waveform equalizer for equalizing a reproduced signal.

Art Unit: 2627

In the same field of endeavor, Miyashita discloses where the information reproducing drive further comprises a waveform equalizer for equalizing a reproduced signal (figure 6).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have included a waveform equalizer in the apparatus of Hayami, for the purpose of obtaining a signal having a greater level of symmetry than the signal reproduced from the disk (¶ 29).

Regarding claim 8, Hayami, in view of Miyashita, discloses everything claimed, as applied to claim 7. However, Hayami fails to disclose a compensation table study unit.

In the same field of endeavor, Miyashita discloses where said drive further includes a compensation table study unit for correcting said pattern compensation table so as to minimize an error between an output from said waveform equalizer and said target value calculated in accordance with an obtained binary bit array (element 45 in figure 6).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have included a compensation table study unit in the apparatus of Hayami, as taught by Miyashita, for the purpose of determining an appropriate target value (¶ 29).

#### ***Allowable Subject Matter***

8. Claims 1-6 are allowed.
9. Claim 9 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.
10. The following is a statement of reasons for the indication of allowable subject matter: the prior art of record, either alone or in combination, fail to teach or fairly suggest:
  - a. In claim 1, "wherein, when said PRML method is represented as  $PR(a_1, a_2, \dots, a_N)$ , the leftmost  $M_1$  coefficient and the rightmost  $M_2$  coefficient in a coefficient array are all zero while integer value  $M_1$  and  $M_2$  satisfy a relationship of ' $M_1 \geq 0, M_2 \geq 0, M_1 + M_2 \geq 1, M_1 + M_2 \leq N$ '; and

Art Unit: 2627

- b. In claim 2, "a step of setting a value larger than an amplitude of said reproduced signal as said compensation value V2 corresponding to said N-bit digital bit array if the run length of said N-bit digital bit array is R2 and less than the minimum run length R2 ( $R2 > R1$ ) signal is to be reproduced"; and
- c. The subtraction operation in claim 9.

#### ***Citation of Relevant Prior Art***

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- a. Ichihara et al (US Patent Application Publication 2002/0101674) disclose a PRML device having a pattern/table compensation unit.

#### ***Response to Arguments***

12. Applicant's arguments, see pages 10-12, filed 15 December 2006, with respect to the rejection of claims 1 and 3 have been fully considered and are persuasive. The rejection of these claims of 15 September 2006 has been withdrawn.

13. Applicant's arguments with respect to claims 7 and 8 have been considered but are moot in view of the new ground(s) of rejection.

#### ***Closing Remarks/Comments***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nathan Danielsen whose telephone number is (571) 272-4248. The examiner can normally be reached on Monday-Friday, 9:00 AM - 5:00 PM Eastern Time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wayne Young can be reached on (571) 272-7582. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2627

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Nathan Daniels  
03/14/2007

ND



WAYNE YOUNG  
SUPERVISORY PATENT EXAMINER